

APPARATUS FOR AUTOMATICALLY OPERATING A DRAIN VALVE IN A WASHSTAND

BACKGROUND OF THE INVENTION

5 1. Field of the Invention

The present invention relates to an apparatus for opening and shutting a drain valve in a washstand, and more specifically, to an apparatus for automatically opening and shutting a drain valve in a washstand, wherein an automatic opening 10 and shutting means for automatically opening and shutting the drain valve is mounted.

2. Discussion of Related Art

15 As noted well, a drain-outlet of a washstand must be equipped with a drain valve for opening and shutting the drain-outlet. Furthermore, as the drain valve is opened and shut by an opening and shutting apparatus, water is contained in a washstand and used water is drained through the drain valve.

A conventional valve opening and shutting apparatus includes a connection 20 link 2 linked to the bottom of a stem 1a in a valve 1, and a working rod 4 whose bottom is linked to the connection link 2 and whose top is exposed outside of a washstand 3, as shown in FIG. 1.

Therefore, if the working rod 4 is pulled upwardly, the connection link 2 linked

to the bottom of the working rod 4 pulls downwardly the valve 1 that is put on, while seesawing with a through-hole 5a of a drain-pipe 5 as its a starting point, thus shutting the upper side of the drain-pipe 5, i.e., a drain-outlet 5b.

On the contrary, if the working rod 4 that is put on is pressed downwardly, the
5 connection link 2 linked to the bottom of the working rod 4 pushes upwardly the valve
1 that is put down, while seesawing with the through-hole 5a portion of the drain-pipe
5 as its a starting point, thus opening the drain-pipe 5.

As this kind of the conventional valve opening and shutting apparatus is a
manual type, it is inconvenient to manipulate the valve. In particular, if the valve 1 is
10 to be shut, it is required that the working rod 4 be pulled up strongly so that the drain-
outlet 5b is shut, as described above. In case of the old and weak and children, the
washstand is used in a state where the valve is not fully shut since they have a weak
strength to pull up the working rod. This causes large amounts of water to be
wasted.

15 Furthermore, as the working rod 4 has to be installed passing through the
washstand 3 outwardly, a through-hole 3a through which the working rod 4 goes
must be formed when manufacturing the washstand. This makes the manufacturing
process difficult.

In addition, as the working rod 4 is protruded outside of the washstand 3,
20 there is danger of an injury or a wound of the hands due to hit to the working rod.
Also it is not good in terms of sanitation and a fine view since alien substances such
as fur are stuck around the working rod.

SUMMARY OF THE INVENTION

Accordingly, the present invention has been made in view of the above problems, and it is a main object of the present invention to provide an apparatus for 5 automatically opening and shutting a drain valve in a washstand, wherein the drain valve is automatically opened and shut.

As such, as the drain valve is automatically opened and shut, it is possible to secure convenience of use. It is also possible to simplify the process of manufacturing a washstand since a working rod is not necessary. Furthermore, it is 10 possible to obviate danger of an injury or a wound and to improve poor sanitation/fine view problems, which are generated by the working rod.

To achieve the above object, according to the present invention, there is provided an apparatus for automatically opening and shutting a drain valve in a washstand, wherein a drain-pipe is connected to the bottom of a washstand, and the 15 top of the drain-pipe, i.e., a drain-outlet is opened and shut by a drain valve built in the drain-pipe, comprising a deceleration motor formed at one side of the drain-pipe, a working cam closely contacting the bottom of the drain valve, wherein the working cam is disposed on the axis of the deceleration motor, and a touch button for turning on/off the deceleration motor, wherein the touch button is disposed at a 20 predetermined portion of the washstand.

Furthermore, the drain-pipe is divided into an upper drain-pipe and a lower drain-pipe, wherein the upper drain-pipe and the lower drain-pipe are combined each other, upper and lower spring housings are built in the upper drain-pipe and the

lower drain-pipe, respectively, wherein the upper and lower spring housings are combined each other with them disposed oppositely, a spring for resiliently supporting the drain valve in a working direction is disposed within the upper and lower spring housings.

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BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a view illustrating the construction of a drain valve opening/shutting apparatus for a washstand according to a prior art.

10 FIG. 2 is a view illustrating the construction of an apparatus for automatically opening and shutting a drain valve, wherein the valve is shut, according to an embodiment of the present invention.

15 FIG. 3 is a view illustrating the construction of an apparatus for automatically opening and shutting a drain valve, wherein the valve is opened, according to an embodiment of the present invention.

FIG. 4 is a view illustrating the apparatus for automatically opening and shutting the drain valve, which is seen from "A" in FIG. 2.

FIG. 5 is a plane view of a spring housing.

20 DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

Now the preferred embodiments according to the present invention will be described with reference to the accompanying drawings.

A mechanism for automatically opening and shutting a drain valve of a washstand will be described in detail with reference to FIG. 2 to FIG. 5.

Referring to FIG. 2 to FIG. 5, the apparatus for automatically opening and shutting the drain valve includes a drain-pipe 20 connected to the bottom of a washstand 10, a drain-outlet 21 that is shut and opened by a drain valve 30 built in the drain-pipe, a deceleration motor 40 that is mounted on one side of the drain-pipe 20 and rotates at a low speed, and a working cam 50 contacting the bottom of the washstand drain valve 30 on the deceleration motor 40.

At this time, a touch button 55 or a lever type button for turning on/off the deceleration motor 40, which is electrically connected to the deceleration motor 40, is formed at a predetermined portion (preferably a position where a user's hands can touch) of the washstand 10.

Furthermore, the drainpipe 20 is divided into an upper drainpipe 22 and a lower drainpipe 23, which are integrally combined by a screw. The drain valve 30 is disposed within the combined body in an upright position.

An upper spring housing 61 and a lower spring housing 62 are installed within the upper drainpipe 22 and the lower drainpipe 23, respectively, in an opposite manner each other. The upper spring housing 61 and the lower spring housing 62 are integrally combined by a screw. At this time, latching jaws 22a and 23a for preventing the upper spring housing 61 and the lower spring housing 62 from fluctuating up and down are disposed within the upper drainpipe 22 and the lower drainpipe 23, respectively.

Furthermore, the upper spring housing 61 and the lower spring housing 62

include latching plates 61a and 62a and spring support units 61b and 62b that are integrally formed at their centers, respectively. In the above, the latching plates 61a and 62a are formed so that drain-holes 61c and 62c are divided by a plurality of ribs 61d and 62d so that drainage is possible.

5 In addition, a spring 70 for resiliently supporting the drain valve 30 in a working direction is disposed within the upper spring housing 61 and the lower spring housing 62, i.e., within the spring support units 61b and 62b.

Also an annular latch unit 31 disposed at the center of the lower spring housing 62 is formed in the washstand drain valve 30. The annular latch unit 31 10 functions to push up the spring 70 when the drain valve rises. It also serves a descending limited jaw for preventing the drain valve from going down to a predetermined position.

An unexplained reference numeral 80 designates a cam support plate for facilitating a surface contact with the working cam 50.

15 The operation of the apparatus constructed above will be described.

In a state where the apparatus for automatically opening and shutting the drain valve is coupled to the washstand, if a user pushes the touch button 55 disposed at a predetermined position of the washstand 10, the power is applied to the deceleration motor 40 and the working cam 50 is simultaneously rotated 180° .

20 By means of the turning radius of the working cam, the washstand drain valve 30 surpasses the force of the spring 70 to vertically rise, thereby opening the drain-outlet 21.

On the contrary, if the user pushes the touch button 55 again, the power is

applied to the deceleration motor 40 and the working cam 50 is simultaneously rotated 180° . By means of the turning radius of the working cam, the washstand drain valve 30 vertically descends to shut the drain-outlet 21. At this time, as the spring 70 downwardly pushes the annular latch unit 31 of the washstand drain valve 30 by its elastic force, so that the washstand drain valve tightly seals the drain-outlet 21.

As described above, the present invention has an effect that it can provides easy manipulation of a washstand compared to conventional manual manipulation since a drain valve is automatically opened and shut by simple touch manipulation.

Furthermore, it is possible to simplify the manufacturing process of a washstand since the process of forming a through-hole where a working rod is disposed is not necessary is obviated.

In addition, as a working rod is not protruded outside of a washstand, there is no danger of an injury or a wound due to the protruded working rod.

Although the foregoing description has been made with reference to the preferred embodiments, it is to be understood that changes and modifications of the present invention may be made by the ordinary skilled in the art without departing from the spirit and scope of the present invention and appended claims.